

this Al interconnector line of thin film, a good fine interconnector line network can be formed with good reproducibility.

EXAMPLE 12

After producing Al targets using various types of elements (compositions shown in Table 12) in the same way as in Example 11, respective Al interconnector line of thin films were obtained by making films by sputtering under the same conditions as in Example 11. These Al interconnector line of thin films were measured to evaluate their properties by the same procedure as in Example 1. Comparative example 12 in Table 12 had the added amount of element determined falling outside the range of the invention.

TABLE 12

Target composition			Evaluated properties of		
Sample No.	Amount of intermetallic compound forming elements (atomic ratio)	Amount of N *1 (atomic ratio)	Al sputter film		
			Specific resistance ($\mu\Omega$ cm)	Hillock density after heat treatment *2	Etching residue *3
Example 12					
1	Al-1.8% Sc	660 ppm	4.7	⊙	Non
2	Al-2.2% La	330 ppm	4.4	⊙	Non
3	Al-1.3% Ce	910 ppm	4.9	⊙	Non
4	Al-2.4% Nd	420 ppm	5.1	⊙	Non
5	Al-2.8% Sm	70 ppm	5.7	⊙	Non
6	Al-3.0% Gd	150 ppm	5.4	⊙	Non
7	Al-4.5% Tb	220 ppm	5.9	⊙	Non
8	Al-11% Dy	290 ppm	6.3	⊙	Non
9	Al-1.2% Sc	3000 ppm	4.6	⊙	Non
10	Al-1.3% Sc	800 ppm	4.8	⊙	Non
Comparative example 12					
1	Al-32% Sc	310 ppm	18.9	⊙	Yes
2	Al-31% La	700 ppm	27.8	⊙	Yes
3	Al-0.0008% Ce	6000 ppm	3.5	X	Non
4	Al-0.0007% Nd	3200 ppm	3.2	X	Non
5	Al-34% Sm	3000 ppm	21.2	⊙	Yes
6	Al-36% Gd	7400 ppm	22.6	⊙	Yes
7	Al-21% Tb	0.003 ppm	19.9	⊙	Yes
8	Al-26% Dy	0.005 ppm	25.6	⊙	Yes

Industrial Applicability

As apparent from the above-described examples, the interconnector line of thin film of the invention has low resistance and also excels in anti-hillock property, etching

property, preventing property of an electrochemical reaction with ITO or the like. Therefore, by using the interconnector line of thin film of the invention, LCD's signal lines, gate lines, and very fine interconnector line network of a semiconductor device can be formed well. And, with the sputter target of the invention, the above-described low resistance interconnector line of thin film can be formed with good reproducibility, and the occurrence of dust in sputtering can be suppressed.

What is claimed is:

1. A sputter target, consisting essentially of 0.001 to 30 at % of at least one first element constituting an intermetallic compound of Al, 0.01 at ppm to 50 at %, with respect to the amount of the first element, of at least one second element selected from the group consisting of C, O, N and H, provided that an amount of N is not more than 3000 at ppm, and the balance of Al.
2. A sputter target, consisting essentially of 0.001 to 30 at % of at least one first element having a standard electrode potential higher than Al, 0.01 at ppm to 50 at %, with respect to the amount of the first element, of at least one second element selected from the group consisting of C, O, N and H, provided that an amount of N is not more than 3000 at ppm, and the balance of Al.
3. The sputter target according to claim 2, wherein the sputter target has the first element which is an element constituting an intermetallic compound of Al.
4. A sputter target consisting essentially of 0.001 to 30 at % of at least one first element having a standard electrode potential higher than Al, 0.01 at ppm to 50 at % of H with respect to the amount of the first element, and the balance of Al.
5. The sputter target according to claim 4, wherein the sputter target contains the H in a range of 500 wt ppm or below.
6. A sputter target, consisting essentially of at least one first element selected from Y, Sc, La, Ce, Nd, Sm, Gd, Tb, Dy, Er, Th, Sr, Ti, Zr, V, Nb, Ta, Cr, Mo, W, Mn, Tc, Re, Fe, Co, Ni, Pd, Ir, Pt, Cu, Ag, Au, Cd, Si, Pb and B, 0.01 at ppm to 50 at %, with respect to the amount of the first element, of at least one second element selected from the group consisting of C, O, N and H, provided that an amount of N is not more than 3000 at ppm, and the balance of Al.

* * * * *